

Antenna Array with Wide Angle Scanning Properties

Nurul H. Noordin¹, Nakul Haridas^{1,2}, Ahmed O. El-Rayis^{1,2}, Ahmet T. Erdogan¹, Tughrul Arslan^{1,2}
Advanced Smart Antenna Technologies Research Group, The University of Edinburgh, Edinburgh EH9 3JL, UK
Sofant Technologies Ltd., Edinburgh EH9 3JL, UK
{N.Noordin, N.Haridas, A.El-Rayis, Ahmet.Erdogan, Tughrul.Arsan}@ed.ac.uk

Abstract — This paper presents a 3-faceted linear array with wide angle scanning property targeting portable devices. With this property, the antenna gain is maintained even when the main beam is steered away from zenith. The arrangement consists of a linear array of eight circular patches conformed to a 3-faceted structure. The radiation pattern and mutual coupling of the proposed structure are compared with three other structures; linear array on a flat surface, linear array on a curved surface and linear array on a 2-faceted surface. Each of the array structures is simulated with the CST Design Suite. Simulation results show that the main beam of the proposed 3-faceted array can be steered to a wide range of $\pm 70^\circ$ from the zenith, but with a trade off in wider beam width and increased side lobe levels. The circular patch array on a 3-faceted surface is fabricated on a FR4 (1.6 mm) substrate. The coupling coefficients are measured and compared to the simulated results.

Keywords - *conformal antennas; wide angle scanning; array antennas*